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07/663,144    03/01/91    STARK

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EXAMINER  
ROSENBERGER, R

MCAULAY, FISHER, NISSEN,  
GOLDBERG & KIEL  
261 MADISON AVENUE  
NEW YORK, NY 10016

ART UNIT	PAPER NUMBER
2505	8

DATE MAILED: 08/27/92

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined

☒ Responsive to communication filed on 5 June 1992 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s) 3 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐

Part II SUMMARY OF ACTION

1. ☒ Claims 1-15, 17-32 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2. ☒ Claims 16 have been cancelled.

3. ☐ Claims \_\_\_\_\_ are allowed.

4. ☒ Claims 1-15, 17-32 are rejected.

5. ☐ Claims \_\_\_\_\_ are objected to.

6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable, ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been ☐ approved by the examiner, ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed on \_\_\_\_\_, has been ☐ approved, ☐ disapproved (see explanation).

12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received  
☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

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Claims 20-25, 30 and 32 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 20 and 21 "the top of the probe" and "said central aperture" have no antecedent basis.

In claim 22 "the tip of the probe", "said probe" and "said central aperture" have no antecedent basis. In claim 24, "the top of the probe" and "said central aperture" have no antecedent basis".

In claims 23, 25, 30 and 32, there is no positively recited step of doing anything definite to selectively choose an operational mode of reflectance transmittance or combined reflectance and transmittance. These claims do not clearly define actual steps of performing method steps which result in the different operational modes.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section

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102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1, 2, 6, 7 and 8 are rejected under 35 U.S.C.

§ 102(b) as being anticipated by Howarth.

Howarth shows, for example in figure 7, providing illumination (from the source) by way of a plurality of different paths (from the source to D1 and from the source to D2) through a specimen having a characteristic to be measured. The system of Howarth senses a plurality of independent signals (at detectors D1 and D2) at the same time, which signals represent optical information obtained from the specimen in response to the illumination, with each signal corresponding to a particular path. The signals are processed in what is disclosed as an appropriate modeling technique for the purpose of minimizing inaccuracies in the optical determination of characteristics of the specimen.

The illumination from the source is provided "at an angle" with respect to the optical axis of the detection means; not the

paths illustrated in figures 2A and 2B.

Claims 7, 9, 10, 20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Tachibana.

Tachibana, in figure 5, shows means for providing illumination to a specimen having a characteristic to be measured along a plurality of different paths; one path is from vertically onto the specimen from half mirror 26a and 29b. There are means (detector 28) for sensing optical information developed by the illumination provided by the illuminated specimen. The system produces a plurality of independent signals corresponding to the different paths, and there are means for processing the signals, using appropriate modeling techniques to minimize the in accuracies in the measurements of the characteristics of the specimen.

The illumination of Tachibana is provided sequentially along the two paths by means of path switching plate 32.

The light in the two paths are modulated by path switching plate 32 and each path has a different modulation characteristic (phase). There is means (37) for demodulating the signals.

The systems of figures 5 of Tachibana has a probe. The tip of the probe (the end with light guides 29a and 29b, and (lens 25) is arranged adjacent a specimen of small size (capsule 1 is of small size). The reflected energy from the specimen is directed to a central aperture in the probe.

Claims 7, 8, 9, 11, 12, and 13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lebling et al.

Lebling et al show means for providing illumination to a specimen along a plurality of different paths, and means for sensing optical information from the illuminated specimen. There are means for developing a plurality of independent signals corresponding in number to the plurality of paths; see column 4, lines 8-30. These signals are used with an appropriate modeling technique to minimize in occurrences in the measurement of the specimen.

Lebling et al discloses directing the illumination simultaneously along the paths; see column 4, lines 30-33.

The structure shown by Lebling comprises a probe with a body portion and a tip portion. There is a central tubular element (fiber bundle 24) surrounded by an annular outer element (housing 2). The tip portion has a central aperture (shown at 24 in figures 3 and 4) which communicates with a central tubular element. There is at least one ring (fiber ring 10, 11, and/or 12) which communicates with the annular outer element. The ring or rings are angled with respect to the longitudinal axis of the probe (see column 5, lines 8-16). There are fiber optic bundles (10, 11, 12) which correspond to the rings and are connected to a source of illumination. The fibers within fiber bundle 24 are optical means disposed in the central tubular element for

receiving optical information resulting from applied illumination to the specimen and for conveying that information to a sensing device.

Claims 14, 20 and 27 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebling et al.

See the discussion of Lebling et al above. Lebling discloses that different angle scan be used, and specifically means 20 degrees and 30 degrees. Thus, it would have been obvious to use approximately  $26^{\circ}$  because the reference teaches the angle scan be varied and  $26^{\circ}$  is within the range of the angles specifically taught.

It would have been obvious to use the arrangement of Lebling et al with other samples than the automobile shown in figure 6, including samples which are small, because those in the art know that such measurements are also useful for objects other than automobiles.

Claims 1-6, 21, 22, 23, 24, 25 and 28-32 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebling et al in view of Azuma et al, Munekuni and Hasegawa.

Labling et al shows what is claimed except that it uses reflected light rather than transmitted light as claimed. It is known to measure the transmitted light existing a sample at a plurality of different angles; thus is shown by both Munekuni and Hasegawa. Since it is known that is equivalent when using

reflected light to use light at different angles (as shown by Lebling et al) and to use a single light source and receive light at different angles (as shown by Azuma et al). Those of ordinary skill would have recognized the equivalence with transmitted light as well and thus would have found it obvious to measure transmitted light in the basic manner of Lebling et al by directing light at more than one angle and measures the transmitted light with a single detector. The structural change to Lebling et al required for such is simply to provide a detector arrangement such as fiber 24 on the opposite side of a translucent sample.

It would have been obvious when providing such a detector on the far side of a sample to keep the detector on the near side as well because this would allow both reflective and transmittance tests and avoid increase the general utility of the device.

It would also have been obvious to duplicate the light sources rather than the detector because this would be an alternative method of obtaining the same result.

Claims 15, 17 and 19 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebling et al in view of Fukui et al.

It would have been obvious to use other known light collection means than the sample fiber bundle 24 of Lebling et al. One such other known arrangement for such systems uses lens means to focus the light onto the detector; this known equivalent

means is shown by Fukui et al.

Claim 18 is rejected under 35 U.S.C. § 103 as being unpatentable over Lebling et al in view of Azuma et al.

It is known in such reflectance measuring arrangements to measure the source intensity, see detector 21 and fiber 13 of Azuma et al. It would have been obvious to provide such means in the device of Lebling et al because such means are known to be useful.

Claim 26 is rejected under 35 U.S.C. § 103 as being unpatentable over Azuma et al in view of Gerber and Ten Bosch et al.

Azuma et al shows the basic optical arrangement with a central illuminating beam and a plurality to fibers at different angles to measure light reflected from the sample. Azuma et al doe snot show rings of fibers. It is known and world have been obvious to so use rings of fibers to increase the amount of light reflected at each angle. Gerber shows it is known to use such rings of fibers in such reflectance measurements.

Azuma et al does not show particular structure for the arrangement. It would have been obvious to make the basic structure in the form of a probe similar to that of Tan Bosch et al, keeping the central tubular element 145 of Azuma et al and arranging the fibers around the axis thereof.



Remarks

As set forth above, Howarth does provide plural paths from the source to the receiver. The paths in Howarth are different path lengths. Thus Howarth does show what is claimed in claims 1, 2, 6, 7, and 8.

Claims 7, 9 and 10 do not distinguish over Tachibana. Those claims read on a reflectance measurement.

The claims do not set forth structure or method steps which distinguish over Lebling et al as applied to claims 7, 8, 9, 11, 12, and 13.

It is noted that claims 11, 27, 28, 29, and 31 each require only "at least one ring", That is, these claims cover a single path to or through the sample. Thus it is not correct to state that these claims are directed to "basic concept" of utilizing two different path lengths" because the claims require only one path length.

It is also noted that no claim requires different path lengths, only different paths. Lebling et al, for example, clearly shows a plurality of different paths, although the paths are of the same length.

Claim 20 calls explicitly for measuring reflected energy, which is what Lebling et al measures.

The claims do not set forth any structure or steps to distinguish the argued "interactance" measurements from the

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reflectance measurements of Lebling et al or known transmission measurements.


**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. A. Rosenberger whose telephone number is (703) 308-4804.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Rosenberger/gm  
August 19, 1992



RICHARD A. ROSENBERGER  
EXAMINER  
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